

# ACIPC Lecture 2024

## An antidote to infection control confusion



Professor Brett Mitchell AM

# Disclosures

- Current recipient of competitive national grant funding from the NHMRC and MRFF
- Editor-in-Chief, Infection, Disease and Health
- Infection Control Matters podcast



# Informing this talk

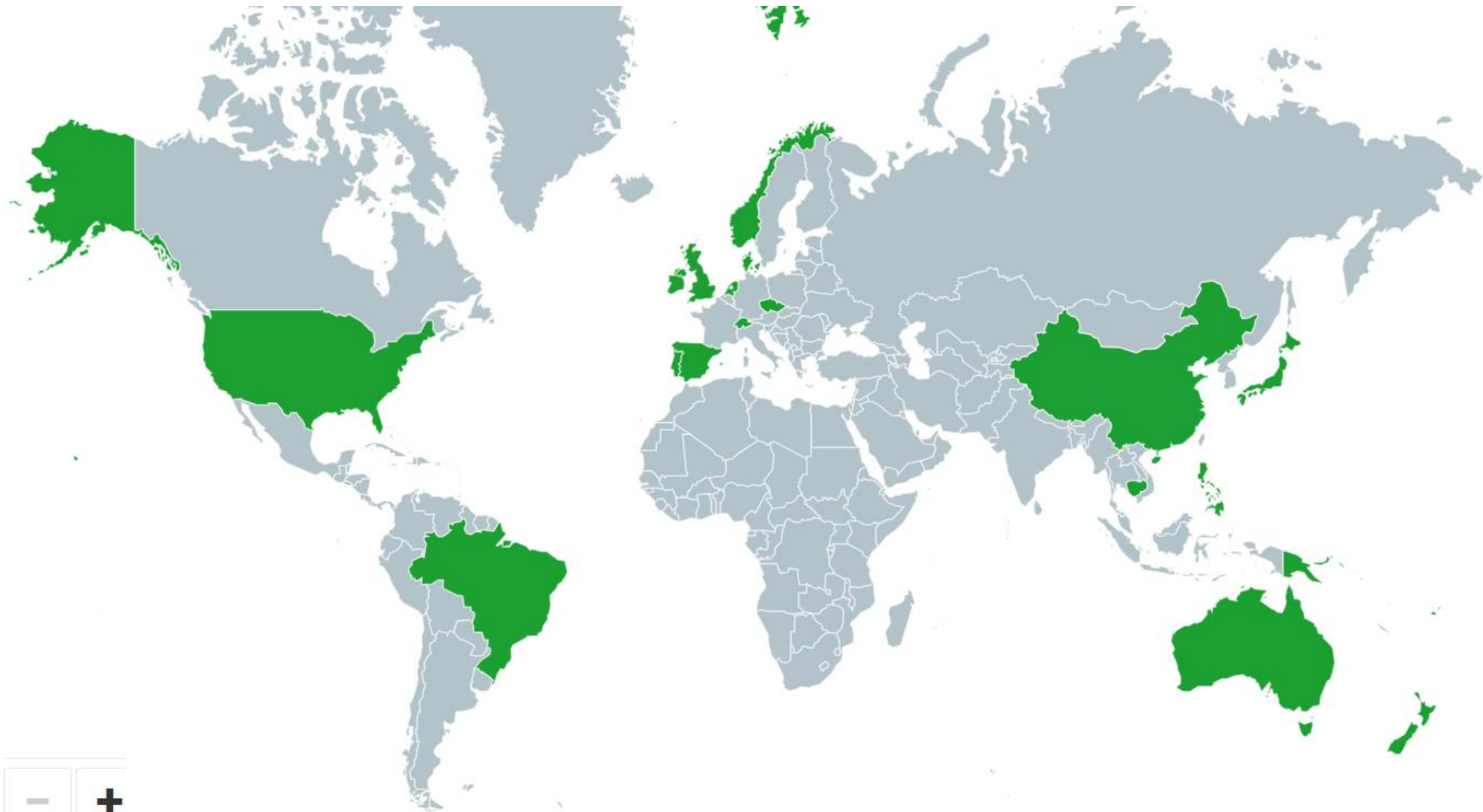
My past experience

Your voice on topics

Evidence

Poke, prod and cause some debate





# Current collaborators – thank you

Maham	Amin
Noleen	Bennett
David	Brain
Kate	Browne
Sarah	Browning
Michelle	Chalker
Allen	Cheng
Julie	Considine
Stephanie	Curtis
Kate	Curtis
Josh	Davies
Sonja	Dawson
Kathy	Dempsey
Loretta	Dimalanta
Samantha	Dix
Deborah	Friedman

Margaret	Fry
Mark	Frydenberg
Kirsty	Graham
Nick	Graves
Debra	Griffiths
Sally	Havers
Susan	Jain
Doug	Johnson
Daneila	Karanfilovska
Hannah	Kent
Martin	Kiernan
Jennie	King
Jason	Kwong
Sue	Lee
Michael	Lydeamore
Deborough	MacBeth

Auxilla	Madhuvu
Kalisvar	Marimuthu
Caroline	Marshall
Melanie	Martin
Georgia	Matterson
Brendan	McCormack
Julee	McDonagh
Alicia	Michel
Julia	Morphet
Maria	Northcote
Jayne	O'Connor
Liz	Orr
Ed	Raby
Helen	Rawson
Jacqui	Reilly
Philip	Russo

Raymond	Sarmiento
Ramon	Shaban
Kaori	Shimoinaba
Jenny	Sim
Andrew	Stewardson
Pat	Stone
Rica	Tamala
Peta	Tehan
Juan-Paolo	Tonolete
Bismi	TSA Abdul
Gary	Verdickt
Catherine	Viengkham
Janet	Wallace
Nicole	White
Rhonda	Wilson
Mae	Wong

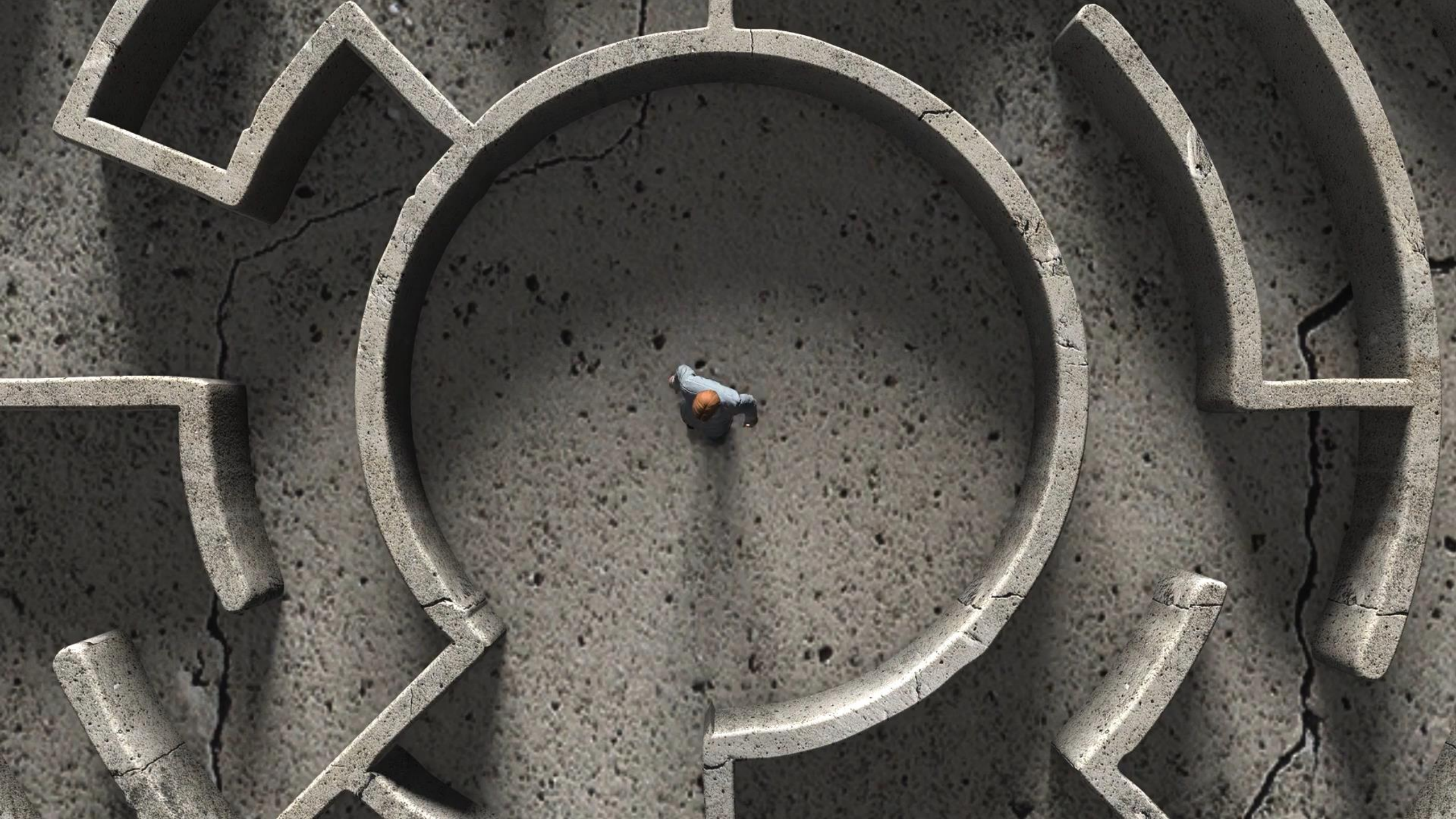
# What do I mean by confusion for this talk?

Being perplexed or disconcerted

Unable to think clearly or to understand something

# What is an antidote?

Something that relieves, prevents, or counteracts

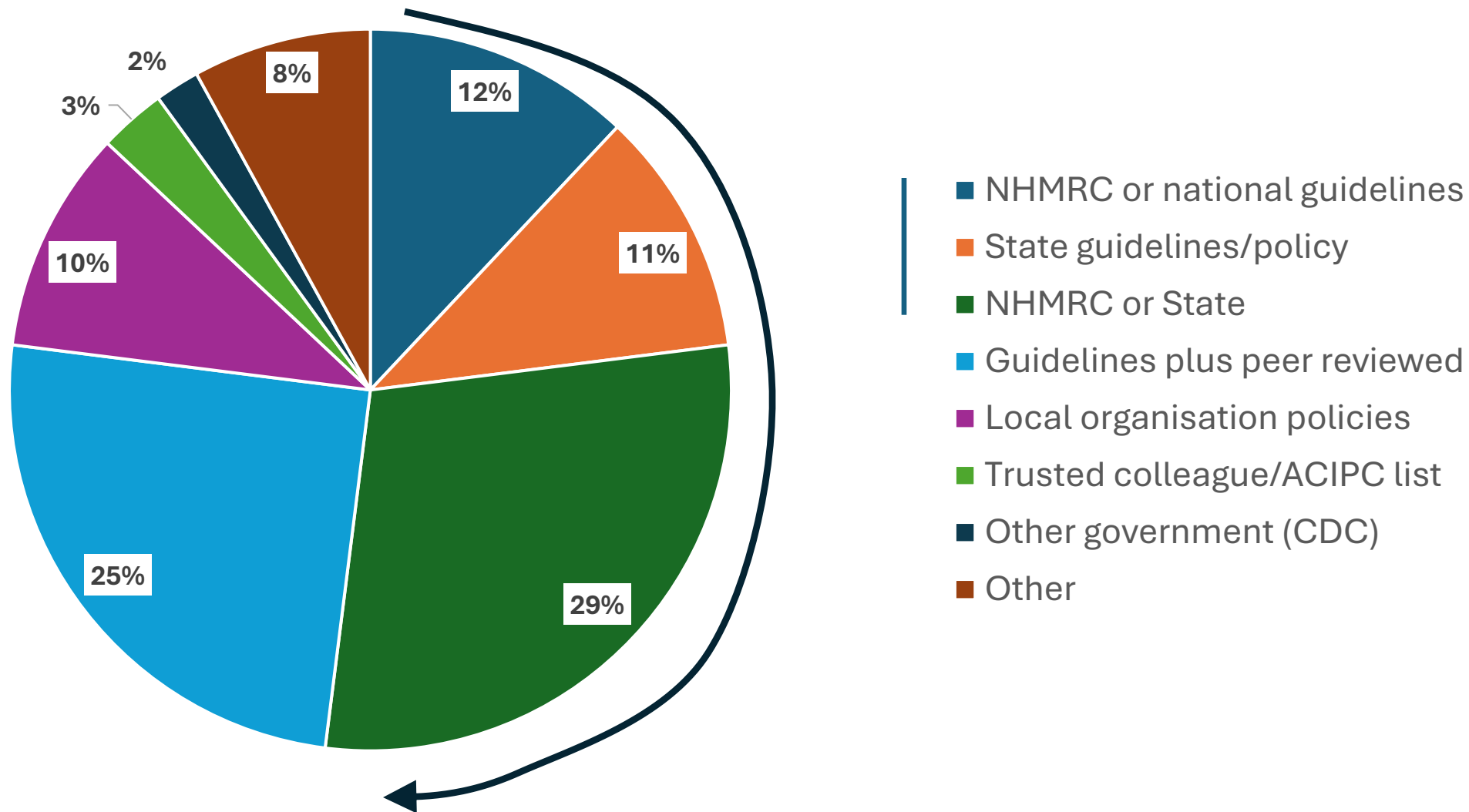


Your voice

# The professions voice in this talk



# Main source of information



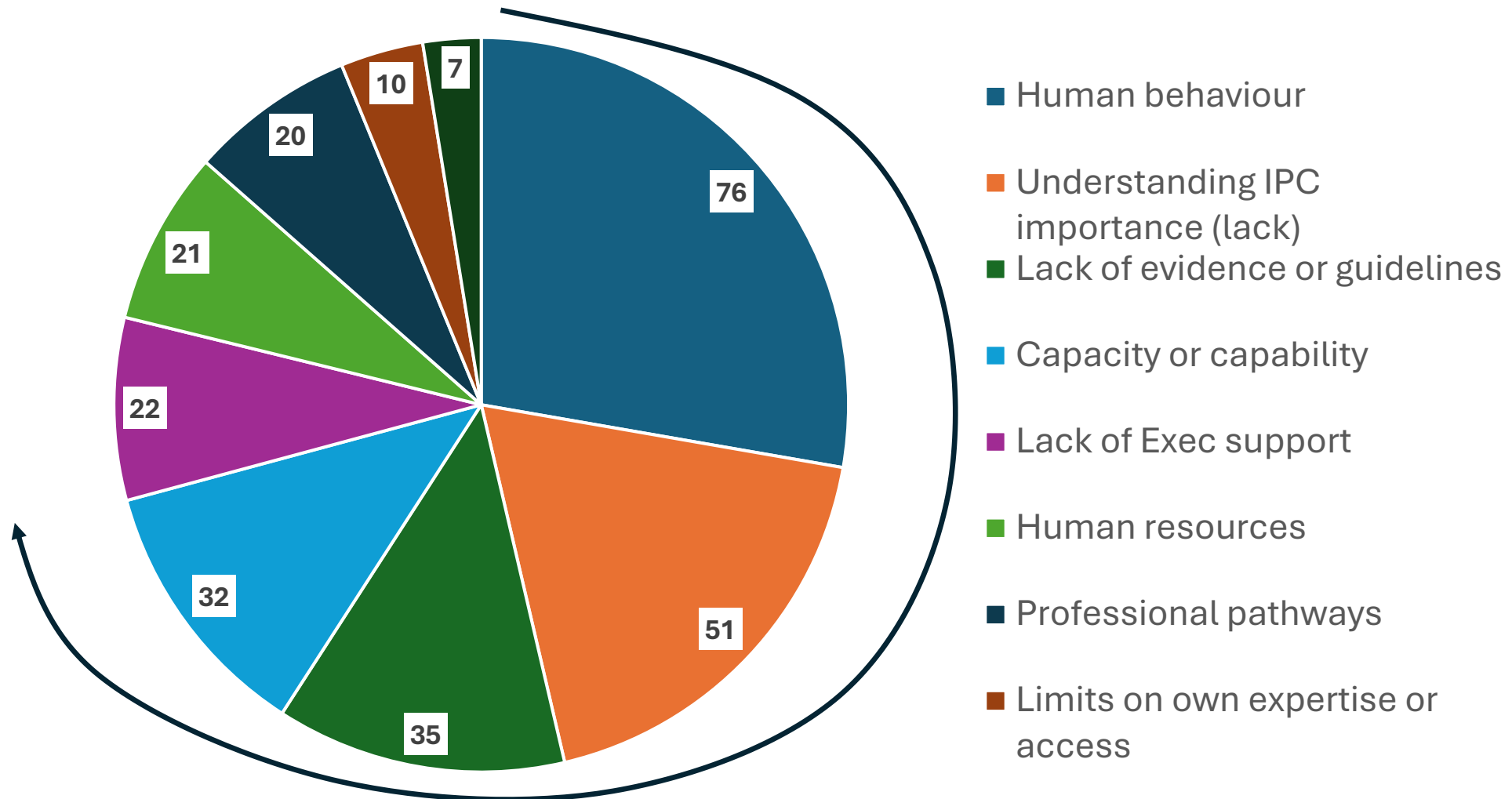
# What topics would you like to see expanded in the State/national guidelines? (free text)

A word cloud of topics for expansion in state/national guidelines. The words are arranged in a roughly circular pattern around the central text 'Cleaning guidelines'. The words vary in size, with 'Cleaning' and 'guidelines' being the largest. Other prominent words include 'Transmission based precautions', 'IPC', 'Standardised', 'Reprocessing', 'Environmental', 'surveillance', 'AS5369', 'unstable', 'risks', 'Surveillance definitions', 'Environmental cleaning', 'screening use national', 'MRO process', 'MRO process', 'disinfection', 'infections', 'including requirements', 'staff practices', 'precautions', 'communityManagement', 'level', 'cleaning audits', and 'level'.

cleaning audits level disinfection including requirements  
communityManagement infections staff practices  
Transmission based precautions IPC precautions  
MRO process Cleaning Standardised  
Reprocessing  
screening use national guidelines Environmental  
Environmental cleaning surveillance AS5369  
risks Surveillance definitions unstable

# Biggest obstacles to do the best job you can

(could choose 3)



# Let's like review the “Hundred” survey

## **Some problems with the approach used**

Limited to ACIPC list – Recruitment bias

Limited to those who chose to participate – Selection bias

Limited options to choose from – Measurement bias

Not cause and effect

Limited information about who completed – Information bias

Self-reporting – Information bias

# Do these issues resonate with you?

- Human behaviour-related challenges
- Understanding the importance of IPC
- Lack of guidelines or evidence
- Capability and capacity within your own team

So.... what is the antidote?

# The antidote...

Research

**The creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings.**

# Provide examples as to why research can help with the issue you face

- Human behaviour-related challenges
- Understanding the importance of IPC
- Lack of guidelines or evidence
- Capability and capacity within your own team

# Human behaviour change

- Human behaviour-related challenges
- Understanding the importance of IPC
- Lack of guidelines or evidence
- Capability and capacity within your own team

- **Behaviour and implementation science**

- the scientific study of methods and strategies that facilitate the uptake of evidence-based practice and research into regular use by practitioners and policymakers

- **Co-design**

- Co-design is a participatory research method that involves consumers and communities in the design process

- **Qualitative research**

- Understanding the why

# Importance of IPC

- Human behaviour-related challenges
- **Understanding the importance of IPC**
- Lack of guidelines or evidence
- Capability and capacity within your own team

- **Identify the problem and importance**

- highlight its potential impact on patients/consumers/HCWs, policy, or practice

- **Qualitative approaches**

- explore the patient, consumer or clinician experience
- explore the why and how

- **Health economics**

# Lack of guidelines or evidence

- Human behaviour-related challenges
- Understanding the importance of IPC
- **Lack of guidelines or evidence**
- Capability and capacity within your own team

# A review of IPC evidence in IPC guidelines

- Human behaviour-related challenges
- Understanding the importance of IPC
- **Lack of guidelines or evidence**
- Capability and capacity within your own team

31 guidelines

1870 individual recommendations

22% used GRADE

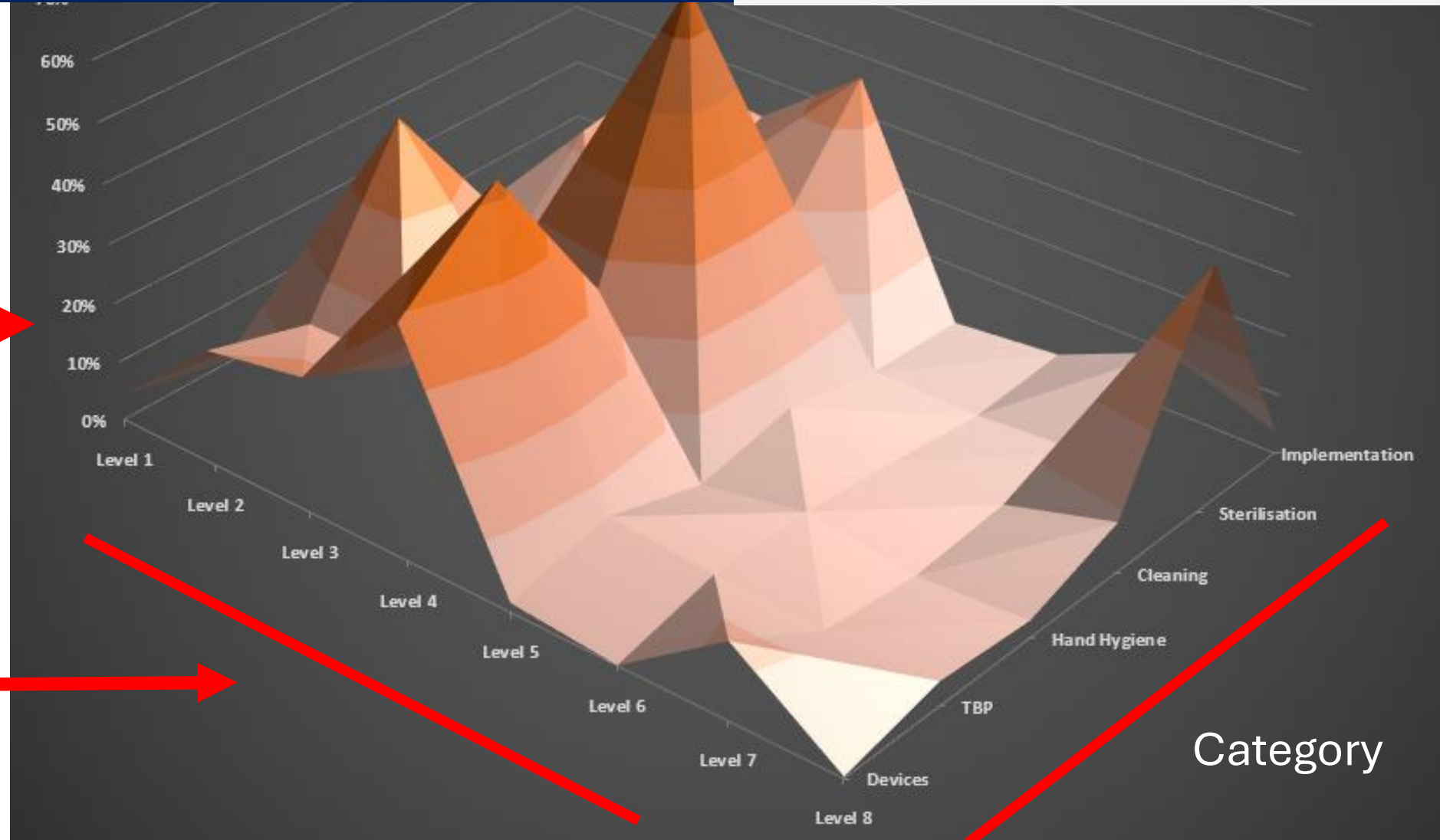
# Overview of strength of evidence in IPC guidelines

- Human behaviour-related challenges
- Understanding the importance of IPC
- **Lack of guidelines or evidence**
- Capability and capacity within your own team

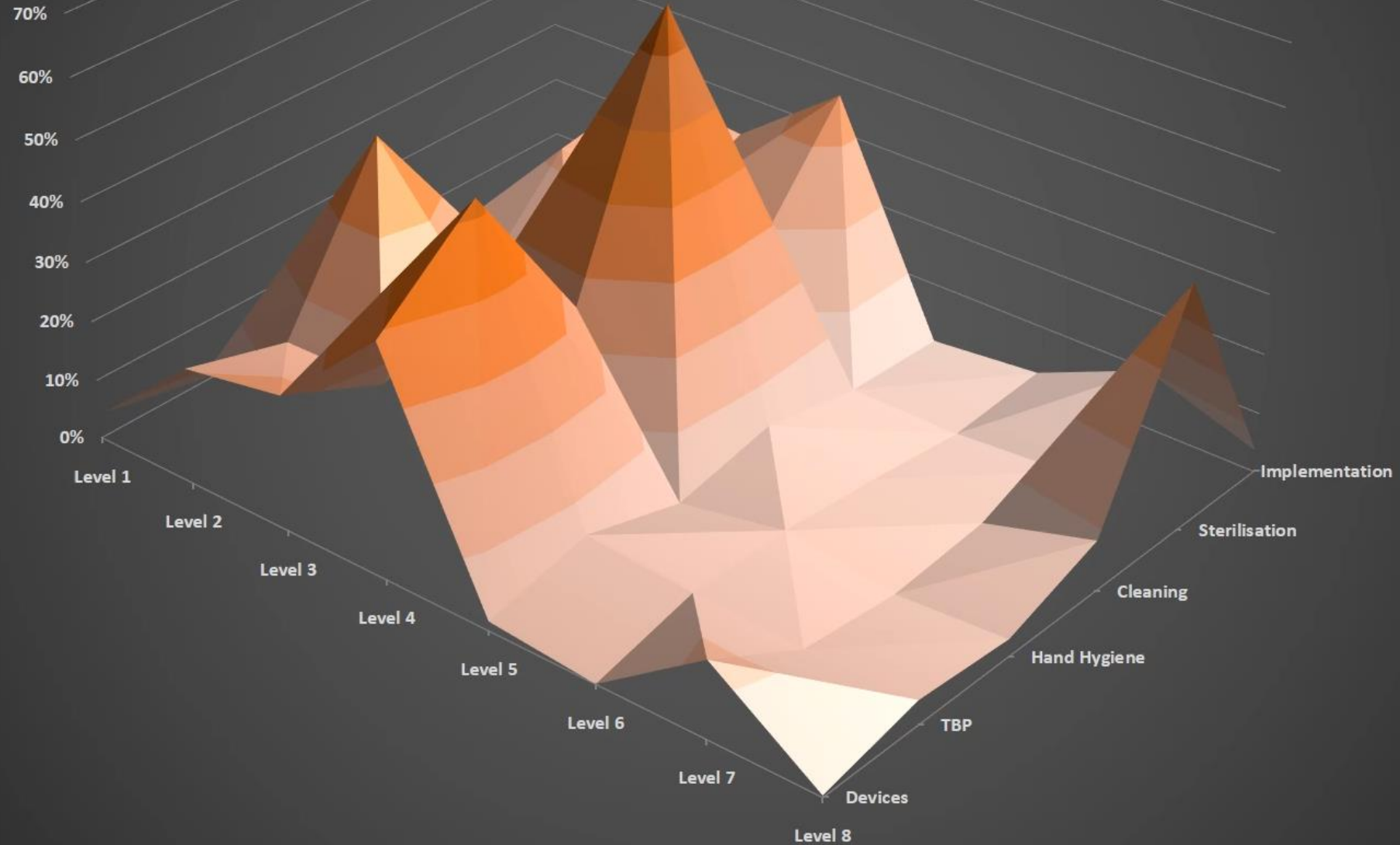
Proportion of recommendations



Level of evidence



Category



# So why is evidence linked to guidelines?

Lack of evidence



Evidence-based  
guidelines

# Capability and capacity in your team

- Human behaviour-related challenges
- Understanding the importance of IPC
- Lack of guidelines or evidence
- **Capability and capacity within your own team**

- Being able to understand and interpret new literature
- Able to risk assess and justify changes to your local approaches
- Communicate evidence in different ways to different audiences
- Professional standing

# What is an antidote?

Something that relieves, prevents, or counteracts

# So why is research an antidote?

**Research  
(lack of)**

**=**

Less understanding of how to implement (human behaviour)

Difficult to demonstrate importance of IPC

Inability to inform guidelines and make strong recommendations

Reduce capacity, capability and professional standing

# Not all research is the same/ What is meant by the best evidence?

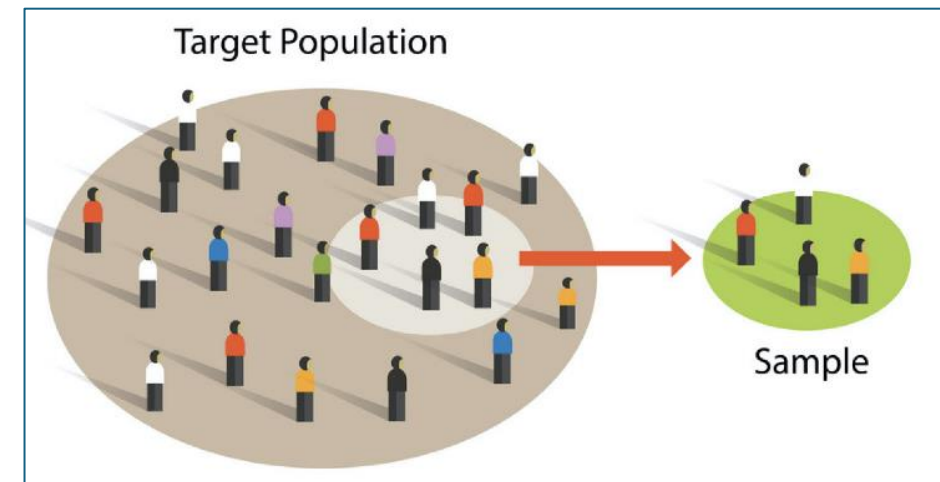


# Why do RCTs?

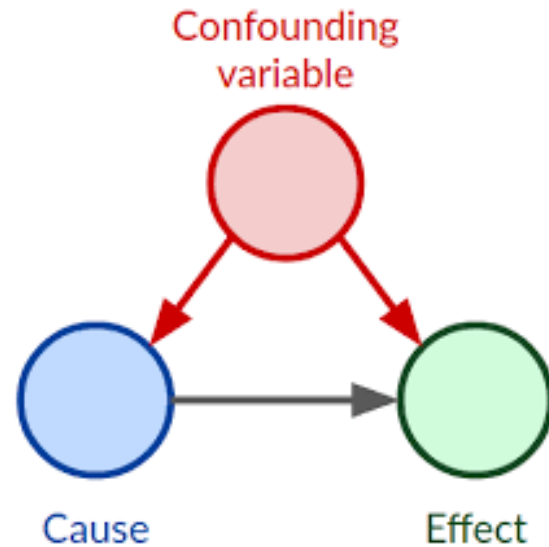
- Provide the best evidence
- Reduce bias
- Help inform national (& other) guidelines

## **Selection bias**

Sampling  
Allocation  
Loss to follow-up

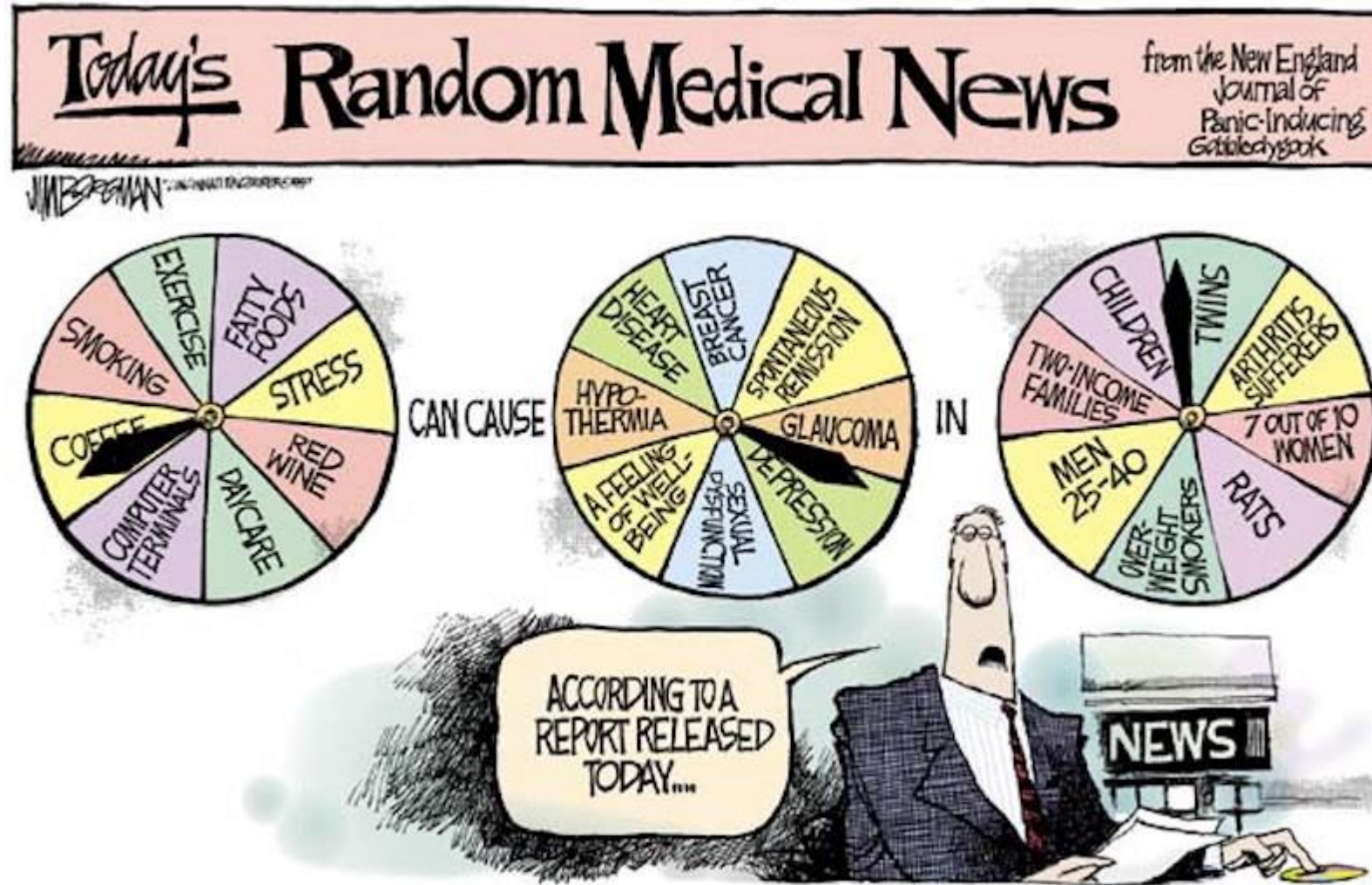


# Why are randomised control trials difficult in IPC?



**ONE QUESTION**

# The need to understand research (not media releases or a one-sided presentation)



By Jim Borgman for The Cincinnati Enquirer

# Don't assume anything

RCTs are useful at ensuring bias is minimised and may throw up interesting findings

*The NEW ENGLAND JOURNAL of MEDICINE*

ORIGINAL ARTICLE

## Trial of Vancomycin and Cefazolin as Surgical Prophylaxis in Arthroplasty

Trisha N. Peel, M.B., B.S., Ph.D., Sarah Astbury, B.Nurs., Allen C. Cheng, M.B., B.S., M.Biostat., Ph.D., David L. Paterson, M.B., B.S., Ph.D., Kirsty L. Busing, M.B., B.S., M.D., Tim Spelman, M.B., B.S., Ph.D., An Tran-Duy, Ph.D., Sam Adie, M.B., B.S., M.P.H., Ph.D., Glenn Boyce, M.B., B.S., Catherine McDougall, M.B., B.S., Robert Molnar, M.B., B.S., Jonathan Mulford, M.B., B.S., Peter Rehfisch, M.B., B.S., Michael Solomon, M.B., Ch.B., Ross Crawford, M.B., B.S., D.Phil., Tiffany Harris-Brown, R.N., M.P.H., Janine Roney, M.P.H., B.H.Sc., R.N., Jessica Wisniewski, Ph.D., and Richard de Steiger, M.B., B.S., Ph.D.,  
for the ASAP Trial Group\*

### CONCLUSIONS

The addition of vancomycin to cefazolin prophylaxis was not superior to placebo for the prevention of surgical-site infections in arthroplasty among patients without known MRSA colonization. (Funded by the Australian National Health and Medical Research Council; Australian New Zealand Clinical Trials Registry number, ACTRN12618000642280.)

# Just because it's an RCT...

- Uncertainty about the sample size estimates
- The study is considerably underpowered
- Not designed as a non-inferiority study, yet conclusions implying non-inferiority
- An absence of evidence

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**Environmental cleaning to prevent hospital-acquired infections on non-intensive care units: a pragmatic, single-centre, cluster randomized controlled, crossover trial comparing soap-based, disinfection and probiotic cleaning**

*Rasmus Leistner,<sup>a,b,\*</sup> Britta Kohlmorgen,<sup>a</sup> Annika Brodzinski,<sup>a</sup> Frank Schwab,<sup>a</sup> Elke Lemke,<sup>a</sup> Gregor Zakonsky,<sup>c</sup> and Petra Gastmeier<sup>a</sup>*

<sup>a</sup>Institute of Hygiene and Environmental Medicine, Charité-Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin and Berlin Institute of Health, Berlin, Germany

<sup>b</sup>Division of Gastroenterology, Infectious Diseases and Rheumatology, Medical Department, Charité-Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin and Berlin Institute of Health, Berlin, Germany

<sup>c</sup>Charité CFM Facility Management GmbH, Berlin, Germany

# Observational studies

"Brushing Teeth May Keep Away Heart Disease: Study Shows People Who Brush Teeth Less Frequently Are at Higher Risk for Heart Disease"

*Is tooth brushing actually the thing preventing heart disease?*

OR

*People who have good oral hygiene happen to have healthier lifestyle habits in general, and therefore have less disease?*

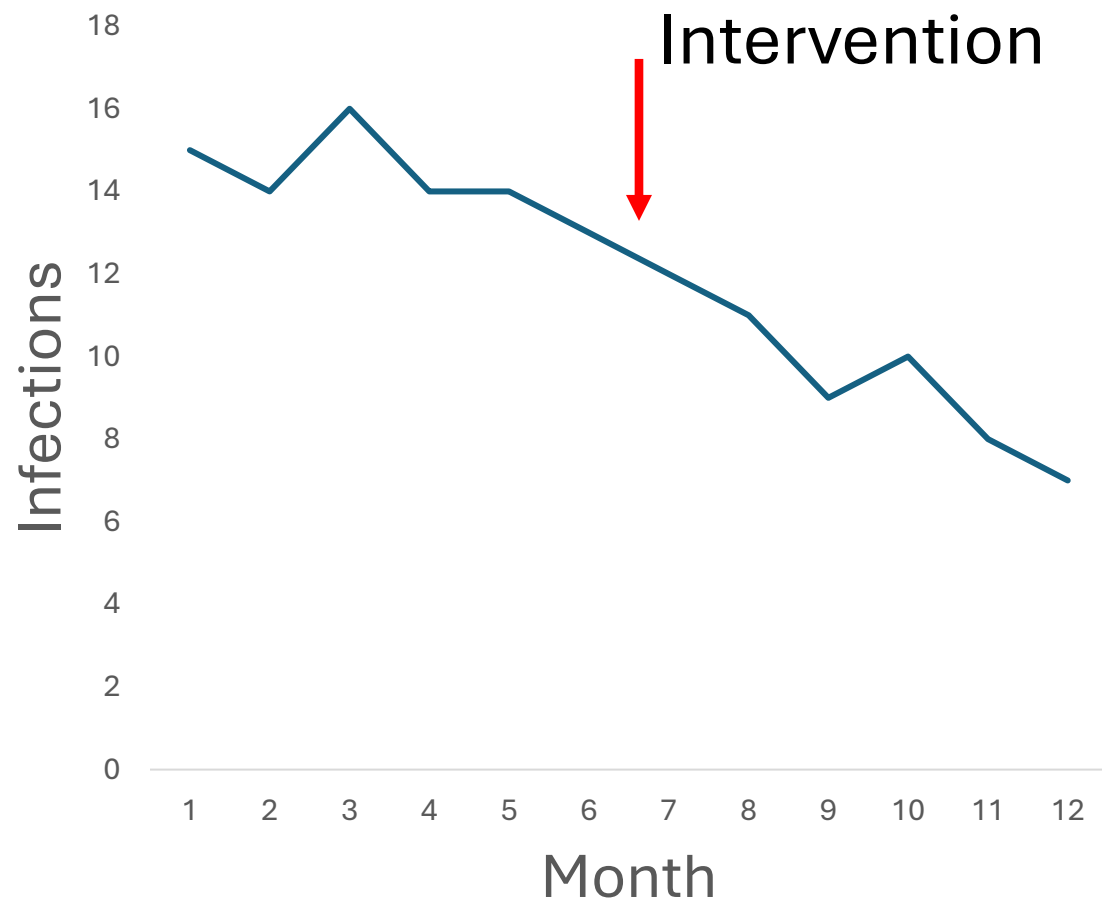
**Observational studies show correlation, not causation**

They make catchy headlines, but are not causative evidence.

# Before and after studies

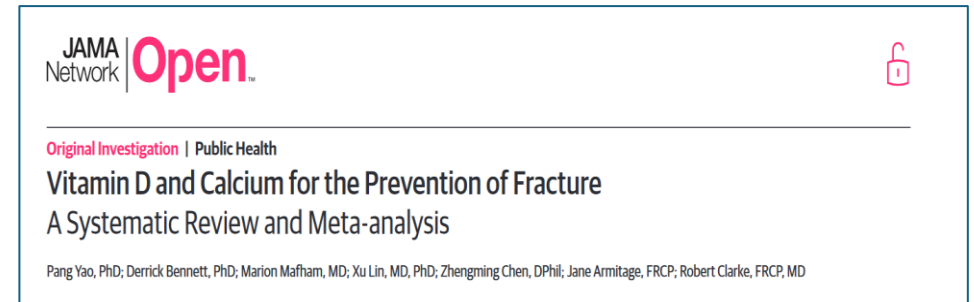
- Lack of a comparison or control group
  - Without a control group, it is difficult to establish the cause and effect relationship
- Often considered and attributed to have a high risk of bias
  - Including selection/assignment, regression to the mean, test-retest, maturation, observer, retrospective, Hawthorne, attrition and publication bias.
- Often cannot be used to inform strong recommendations in guidelines

# Riding the wave



# Example of differences between RCTs and observational studies

- **Vitamin D for the prevention of fracture**
  - 11 observational studies, help prevent fractures
  - 11 RCT, do not help
- **The effect of aspirin for primary prevention of heart disease in healthy individuals**
  - Observational studies – low-dose aspirin could reduce the risk of heart attacks
  - RCT - no benefit
    - ASPEE trial, 16,000+ participants
    - aspirin a day does not prolong years of good health for ‘healthy’ older adults



## Effect of Aspirin on Disability-free Survival in the Healthy Elderly

J.J. McNeil, R.L. Woods, M.R. Nelson, C.M. Reid, B. Kirpach, R. Wolfe, E. Storey, R.C. Shah, J.E. Lockery, A.M. Tonkin, A.B. Newman, J.D. Williamson, K.L. Margolis, M.E. Ernst, W.P. Abhayaratna, N. Stocks, S.M. Fitzgerald, S.G. Orchard, R.E. Trevaaks, L.J. Beilin, G.A. Donnan, P. Gibbs, C.I. Johnston, J. Ryan, B. Radziszewska, R. Grimm, and A.M. Murray, for the ASPREE Investigator Group\*

# Example - IPC



ELSEVIER

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

American Journal of Infection Control

journal homepage: [www.ajicjournal.org](http://www.ajicjournal.org)



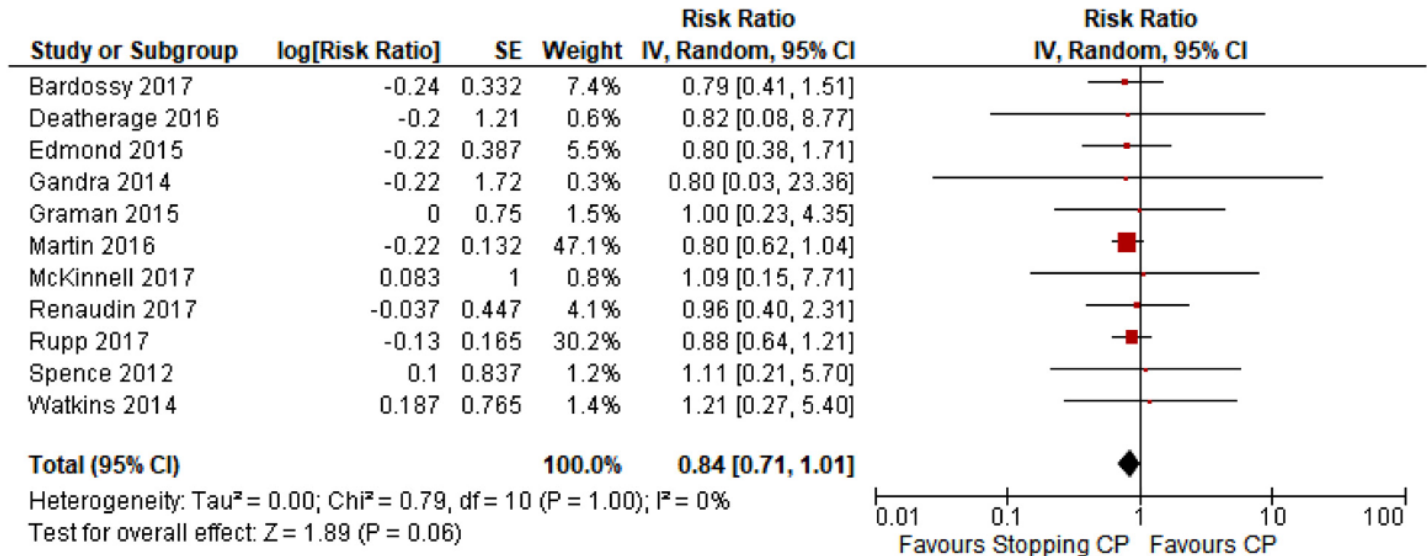
Major Article

## Does the removal of contact precautions for MRSA and VRE infected patients change health care-associated infection rate?: A systematic review and meta-analysis



Robert Kleyman DO<sup>a,\*</sup>, Sophia Cupril-Nilson DO<sup>a</sup>, Kent Robinson DO<sup>a</sup>, Shaival Thakore MD<sup>a</sup>, Furqan Haq PhD, MPH<sup>b</sup>, Liwei Chen PhD, MPH<sup>c</sup>, Olugbenga Oyesanmi MD<sup>b</sup>, Kimberly Browning BSN<sup>b</sup>, Joseph Pino MD<sup>b</sup>, Rahul Mhaskar PhD, MPH<sup>c</sup>

No randomised control trials

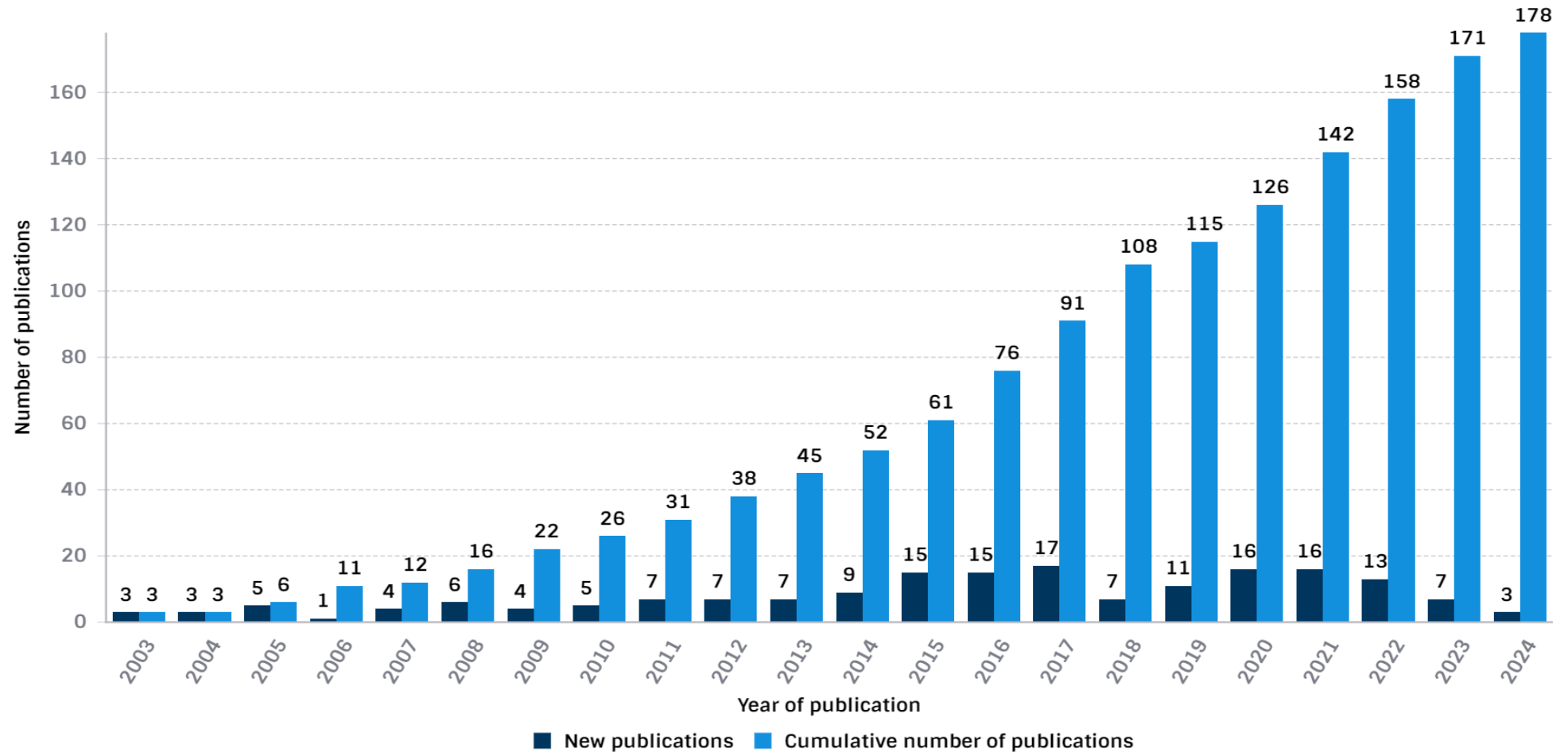


# IPC research

Much of IPC literature is grounded in non-randomised, observational studies

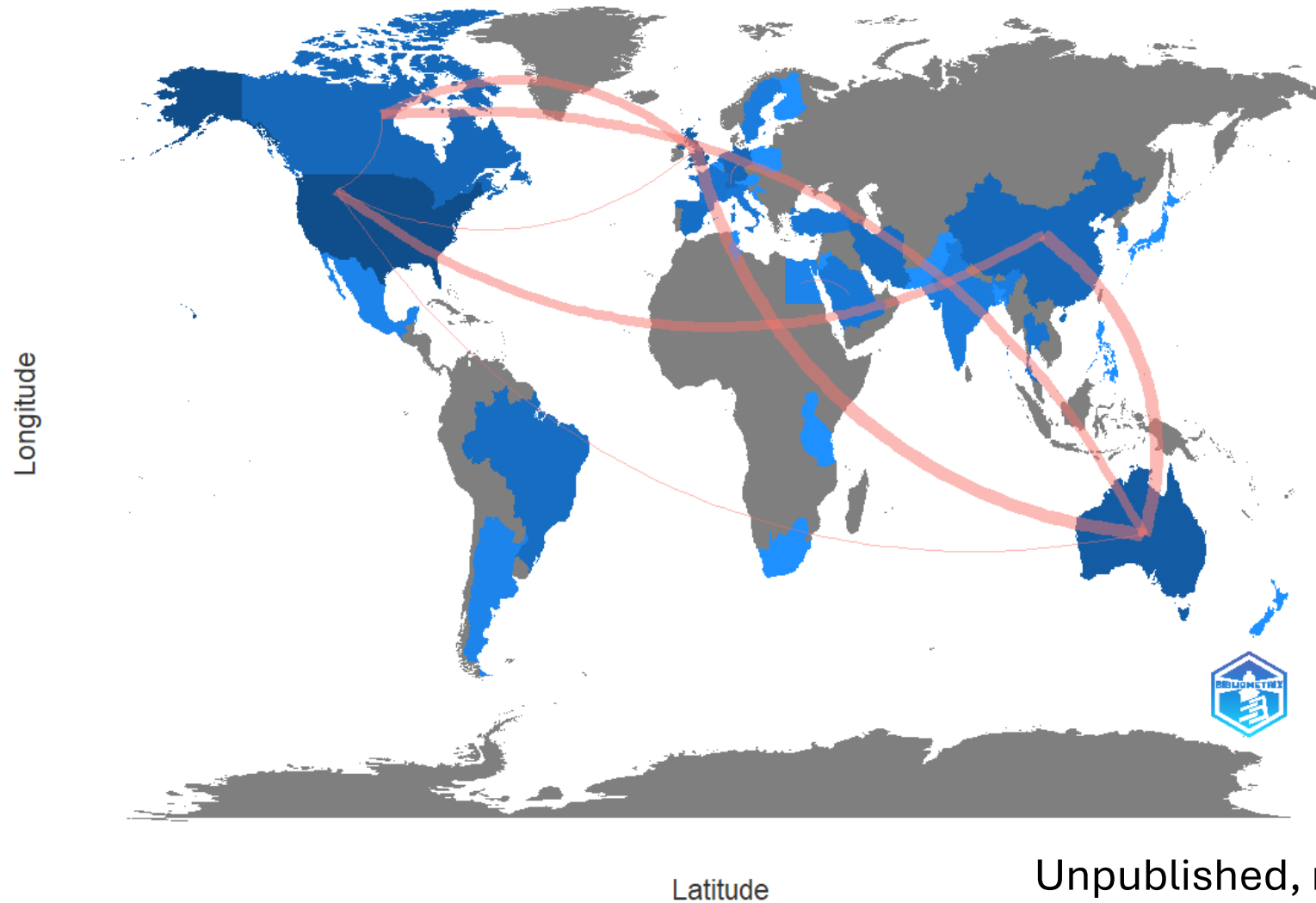
RCTs are not always needed, suitable or possible

# So are we undertaking RCTs in IPC?

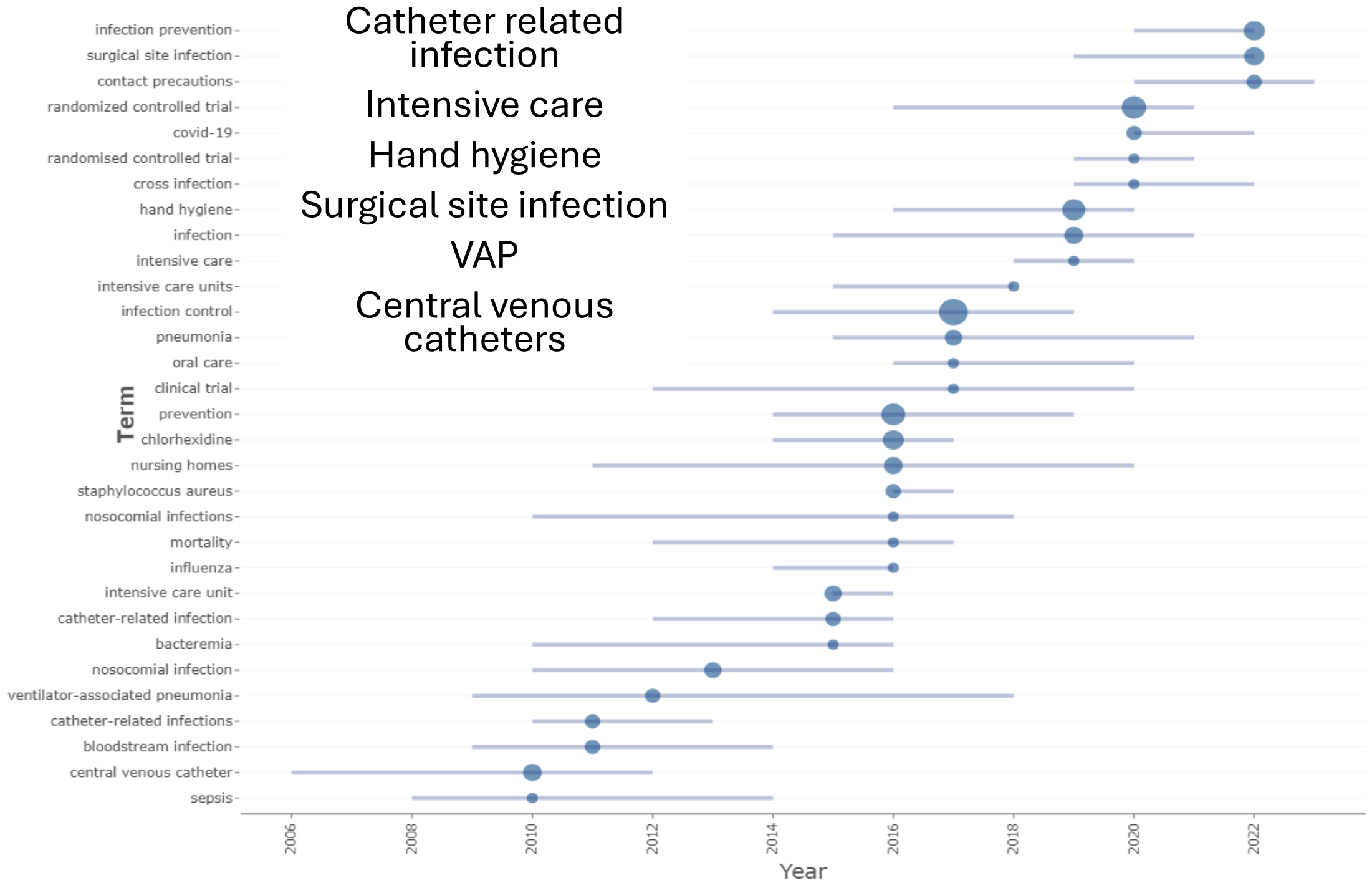


Unpublished, review in progress

# Where is IPC RCT research being done?



Unpublished, review in progress



# IPC, evidence and sustainability



## ACTION

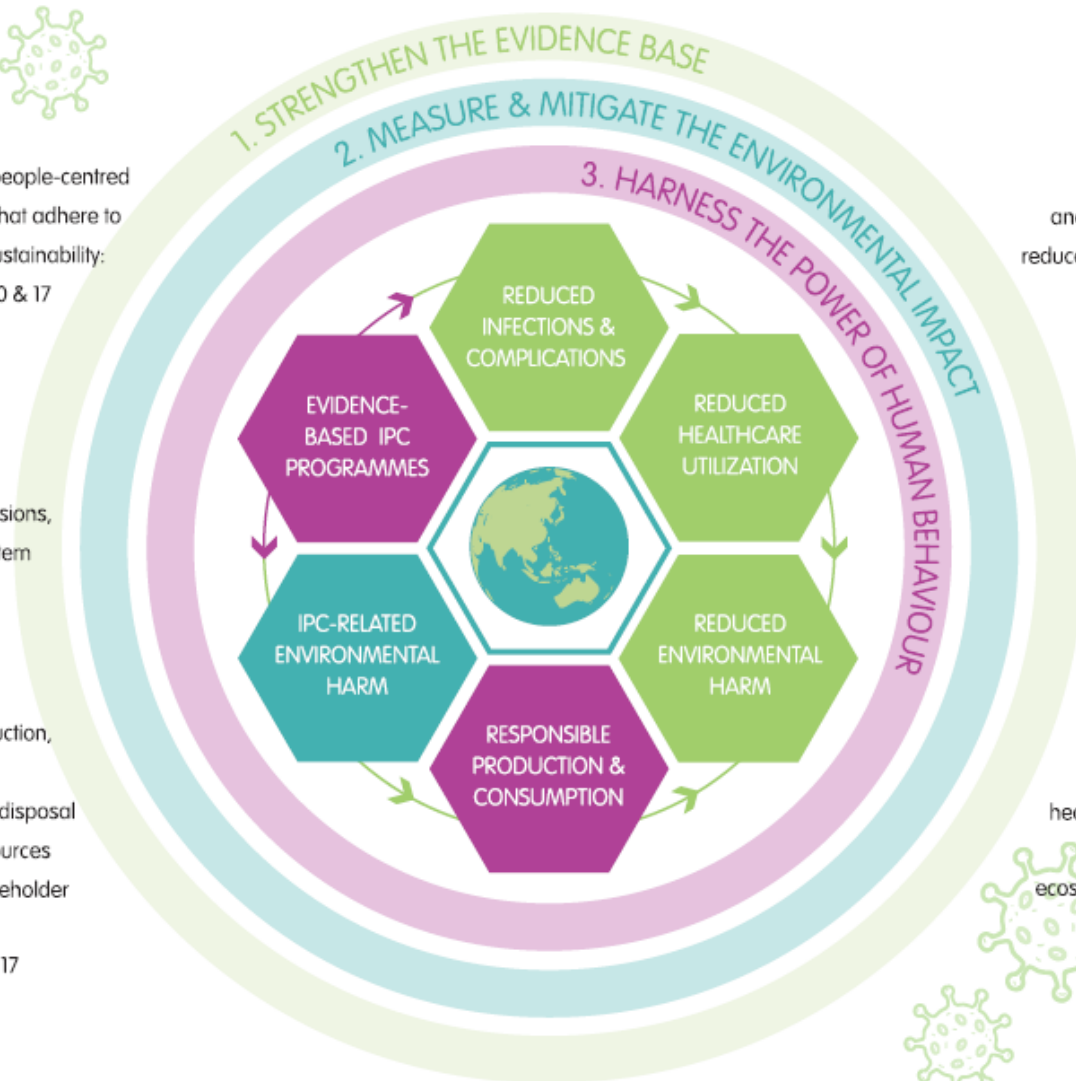
Evidence-based, people-centred IPC programmes that adhere to the principles of sustainability: UN SDGs 3, 6, 9, 10 & 17

## OUTCOME

IPC programmes contribute to health sector emissions, waste and ecosystem contamination

## ACTION

Responsible production, procurement, consumption and disposal of IPC-related resources through multi-stakeholder partnerships: UN SDGs 9, 12-15, 17



## OUTCOME

Reduced infections and their complications, reduced opportunity for the development and spread of AMR

## OUTCOME

Reduced healthcare demand and reduced use of health sector resources

## OUTCOME

Reduced health sector emissions, waste and ecosystem contamination



## COMMENT

## Open Access



## Infection prevention and control programme priorities for sustainable health and environmental systems

Gemma L. Saravanos<sup>1,2\*</sup>, Md Saiful Islam<sup>3</sup>, Yuanfei Huang<sup>4,5</sup>, Jocelyne M. Basseal<sup>1</sup>, Holly Seale<sup>3</sup>, Brett G. Mitchell<sup>6,7</sup> and Meru Sheel<sup>1,8</sup>



Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: <http://www.journals.elsevier.com/infection-disease-and-health/>



Discussion paper

## Sustainability and novel technologies to improve environmental cleaning in healthcare – Implications and considerations

S. Jain<sup>a,\*</sup>, K. Dempsey<sup>a</sup>, K. Clezy<sup>a</sup>, B.G. Mitchell<sup>b,c,d</sup>, M.A. Kiernan<sup>b,e</sup>

# Cost

About how much funding does IPC research receive?

0.1%

Courtesy: Jessica Schults (UQ) and team

# Potential solutions to help reduce IPC confusion

1. Improving own understanding of research, not all research is equal
2. Being engaged in research, including your needs
3. Engaged in peer review
4. International living guidelines, adapted locally
5. Research network to unlock opportunities and build capacity

## **Peer review**

*Don't have to be an expert at research methods or statistics!*

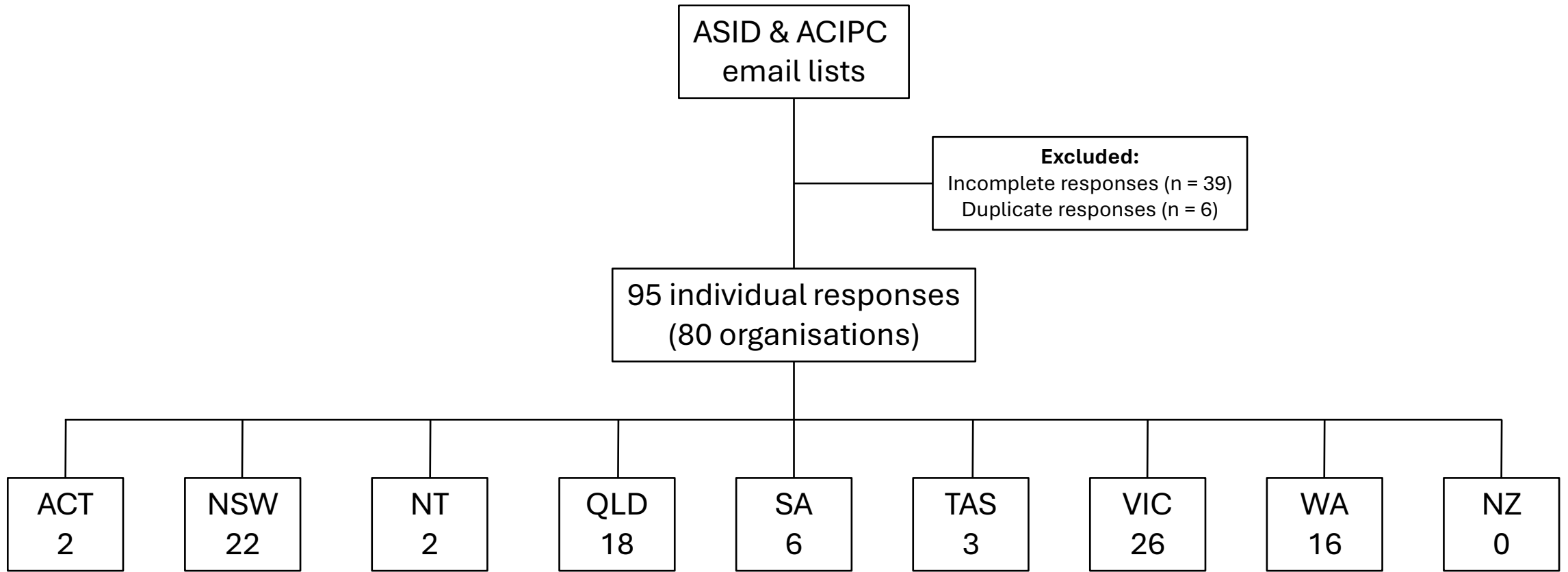
*Many in this room have expertise in one or more areas of IPC*

- Demonstrate your expertise
- Uphold integrity
- Increase your expertise and skills
- Connect with peers
- Keep up to date with the latest

# An Australian IPC research network

Being led by ACIPC research committee in collaboration with ID colleagues

- Survey to ACIPC and ASID members



Leadership role in healthcare organisation:  
Medical = 24  
Nursing = 38  
Other = 14

Currently involved in active IPC research:  
Yes = 31  
No = 30  
No response = 34

# Would you and/or your health service be interested in being involved in a Healthcare Infection Prevention and Control (IPC) Research Platform / Network?

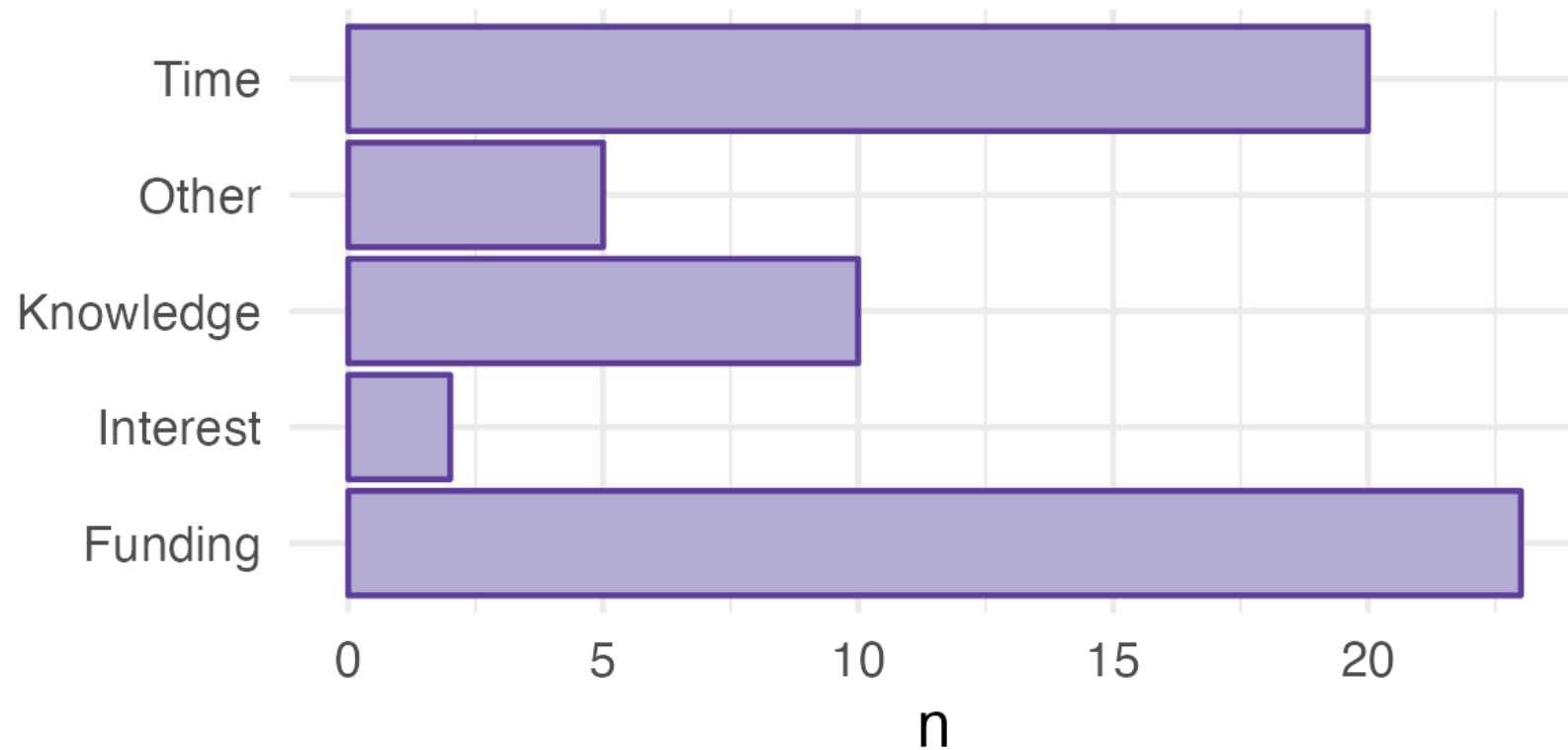
Yes	47 (49%)
Maybe	17 (18%)
No	3 (3%)
No response	28 (29%)

100% of those currently actively involved in research responded “Yes” (n=27) or “Maybe” (n=4)

# Research interests: field



# Barriers to research



*Among respondents not currently participating in active IPC research (n=30), what are the main barriers to being involved?*

# Fostering research: Lets collaborate

CLINICAL

ACADEMIC

POLICY

INDUSTRY



When it comes to your views on  
research....

# If research is the antidote, what could you do?

1. Improving own understanding of research
2. Being engaged in research, including your needs
3. Engaged in peer review
4. International living guidelines, adapted locally
5. Research network to unlock opportunities and build capacity

# ACIPC Lecture 2024

## Research An antidote to infection control confusion



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